

REMARKS

Please reconsider the application in view of the above amendments and the following remarks. Applicant thanks the Examiner for carefully considering this application.

Disposition of Claims

Claims 1-11 and 13-22 are currently pending in this application. Claim 12 has been cancelled by this reply without prejudice or disclaimer. Claims 1, 13, 21, and 22 are independent. The remaining claims depend, directly or indirectly, from claims 1 and 13.

Claim Amendments

The independent claims have been amended to clarify that the dynamic striping policy can be changed to obtain an updated dynamic striping policy. Further, the independent claims have been amended to clarify that subsequent data blocks are stored “using the updated dynamic striping policy,” and clarifying the invention by correcting antecedent basis issues. Independent claims 1 and 21 have been amended to incorporate all limitations of dependent claim 12. Independent claim 13 and 22 have been amended to clarify that data blocks are stored in a hierarchical tree structure. Dependent claims 2, 4, 10, 11, and 20 have been amended to correct formalities. Further, dependent claim 12 has been cancelled.

No new matter is added by way of these amendments. Support for these amendments may be found, for example, in paragraph [0033], [0038], and [0045] in the Specification.

Rejections under 35 U.S.C. § 102

Claims 1-11, 13-15, and 17-22 are rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Publication No. 2002/0161972 (“Talagala”). Claims 1, 13, 21, and 22 have been

amended by this reply to clarify the invention recited. To the extent that this rejection may still apply to the amended claims, the rejection is respectfully traversed.

The invention, as recited in the amended claims, is directed towards a file system that uses a hierarchical tree structure to reference data blocks in a storage pool. In one embodiment of the invention, data is stored in the file system by striping the data across multiple disks in the storage pool, where the striping is dictated by a dynamic striping policy. In one embodiment of the invention, the dynamic striping policy may be updated (*i.e.*, changed) at any time before, after, or during the striping process (*see* Specification, paragraph [0038]). Depending on the user's needs, the dynamic striping policy can be designated as: a policy based on physical disk speed, a policy based on free space available on physical disk, a round robin policy, etc. (*see* Specification, paragraph [0032]).

In one embodiment of the invention, data previously stored using a particular dynamic striping policy may be retrieved from the storage pool regardless of any subsequent changes to the dynamic striping policy because the hierarchical tree structure is used to relate the data blocks in the stripe (*see* Specification, paragraph [0038]). Accordingly, because the hierarchical tree structure can retrieve data independent of the dynamic striping policy and therefore independent of the number of disks utilized, the number of disks in the system can be expanded dynamically at which point the file system can immediately begin using the new disk without rebuilding the disk array (*see* Specification, paragraph [0042]-[0044]).

Turning to the rejection of the claims 1 and 21, for anticipation under 35 U.S.C. § 102, the reference must teach every aspect of the claimed invention either explicitly or impliedly. Any feature not directly taught must be inherently present (*see* MPEP § 2131). Claims 1 and 21 have been amended to incorporate all limitations of cancelled claim 12. The Examiner has

admitted that Talagala fails to teach the limitations of claim 12; therefore, amended independent claims 1 and 21 are patentable over Talagala.

Turning to the rejection of the claims 13 and 22, for anticipation under 35 U.S.C. § 102, the reference must teach every aspect of the claimed invention either explicitly or impliedly. Any feature not directly taught must be inherently present (*see* MPEP § 2131). The Applicant respectfully asserts that Talagala does not disclose the use of a hierarchical tree structure to reference data blocks in a storage pool as recited in the amended independent claims 13 and 22.

Specifically, Talagala relates to a data storage array employing a circular linklist structure to reference data blocks in a storage pool. A circular linklist describes a data structure where each segment references the next segment in the linklist except for the last segment, which holds a reference to the first segment in the linklist (*see* Talagala, figure 5A, 5B, 5C, 6A, 6B, 6C; paragraph [0056], [0057]). Further, no segment in the circular linklist is able to hold references to multiple child segments as is possible in a hierarchical tree structure.

In contrast, the present invention discloses the use of a hierarchical tree structure to reference data blocks in a storage pool. A hierarchical tree structure allows for each data block stored in the tree to reference a plurality of child data blocks (*see* Specification, figure 3; paragraph [0033]). No matter how broadly the Examiner reads the phrase hierarchical tree structure, it cannot be reasonably said that the circular linklist used in Talagala discloses the hierarchical tree structure disclosed in the present invention.

Further, with respect to dependent claims 4, 8-10, and 18-20, Talagala fails to disclose the use of a metaslab in a file system. Applicant respectfully asserts that the Examiner incorrectly states that the parity groups described in Talagala and the metaslabs recited in the amended claims are equivalent. The Examiner references paragraph [0043] and [0065] and figures 6C, 7B, and 8B which disclose that parity groups are analogous to stripes (*i.e.*, blocks

containing data across non-contiguous segments of a physical disk). For example, Talagala explicitly discloses a RAID 0 algorithm that “implements a striped disk array in which data is broken down into blocks and each block is written to a separate disk drive” (*see* Talagala, paragraph [0007]). Thus, the parity groups in Talagala necessarily contain data because a parity group is a grouping of data blocks that have already been written to the file system (*see* Talagala, paragraph [0039]-[0044]).

On the other hand, the metaslabs recited in the dependent claims are contiguous sections of physical disk space that have been allocated for writing but do not initially contain any data (*see* Specification, paragraph [0031], [0033]). Accordingly, the parity groups in Talagala are not equivalent to metaslabs or the referencing of metaslabs using metaslab ID’s recited in the claimed invention.

In view of the above, it is clear that Talagala fails to disclose or suggest each and every element of the amended independent claims. Thus, amended independent claims 1, 13, 21 and 22 are patentable over Talagala. Dependent claims 2-11 and 14-20 are patentable for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

Rejections under 35 U.S.C. § 103

Claims 12 and 16 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Talagala in view of U.S. Publication No. 2004/0123063 (“Dalal”). Claim 12 has been cancelled in this reply, so its rejection under 35 U.S.C. § 103(a) is moot. As discussed above, independent claims 1 and 21 have been amended to incorporate all limitations in claim 12. To the extent that this rejection may still apply to the amended claims 1, 16, and 21 this rejection is respectfully traversed.

To establish a *prima facie* case of obviousness “...the prior art reference (or references when combined) must teach or suggest all the claim limitations.” (See MPEP §2143.03). Further, “all words in a claim must be considered in judging the patentability of that claim against the prior art.” (See MPEP §2143.03). The Applicant respectfully asserts that the references, when combined, fail to teach or suggest all the claim limitations of claims 1, 16, and 21.

Specifically, as described above, Talagala fails to teach or suggest the limitations of the amended independent claims. Further, Dalal fails to supply that which Talagala lacks. In particular, Dalal describes a system where a striping policy is *predetermined and stored* as data in a logical volume at the inception of the logical volume (see Dalal, paragraph [0084], [0140], [0270] and figures 8, 9, 18, 22). This striping policy is static throughout the life of the logical volume (see Dalal, paragraph [0275]). Applicant asserts that the Examiner incorrectly relies on Dalal for the purpose of disclosing the use of a “dynamic striping policy”. The purported dynamic striping policy allegedly taught in Dalal is directed toward the designation of an optimized striping policy upon the creation of a logical disk, where the *same* optimized striping policy is to be used for all data writes to that logical disk (see Dalal, paragraph [0084]). In other words, Dalal fails to disclose a file system where the dynamic striping policy can be changed at any time before, after, or during the striping process (see Specification, paragraph [0038]). Rather, the dynamic striping of Dalal is predetermined and unmodifiable after the creation of a logical disk. Accordingly, Dalal’s description of a striping policy stored in the logical disk fails to disclose the updating of the dynamic striping policy in the present invention.

In view of the above, it is clear that Talagala and Dalal, whether considered separately or in combination, fail to render independent amended claims 1 and 13 obvious. Dependent claim

16 and independent claim 21 are patentable for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

Conclusion

Applicant believes this reply is fully responsive to all outstanding issues and places this application in condition for allowance. If this belief is incorrect, or other issues arise, the Examiner is encouraged to contact the undersigned or his associates at the telephone number listed below. Please apply any charges not covered, or any credits, to Deposit Account 50-0591 (Reference Number 03226/393001).

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Respectfully submitted,

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